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nomena at and around the time that Halley's comet was in transit on the sun, in this country and the West Indies. The chief material for this summary is the responses to a circular letter issued by the chief of the Weather Bureau to nearly two hundred of its observers. No magnetic or electric phenomena were noted that could reasonably be attributed to the comet. At many places, however, parhelia of unusual brilliancy and general appearance were seen; concerning these Dr. Humphreys concludes that "at present the possibility of the comet's influence in producing them can not be definitely excluded."

*Report of the Committee on Luminous Meteors:*

CLEVELAND ABBE (chairman).

The chairman reported that, owing to his removal from Baltimore to Mount Weather, he had not been able to construct the apparatus for continuous photographic registration of the paths and times of bright meteors that pass within 45 degrees of the zenith. But this he expects to accomplish during the next year. The urgency of this class of work has been materially increased by recent theoretical memoirs on the composition, temperature and motions of the upper atmosphere. The success of such apparatus is assured by the recent work of Störmer, who has succeeded in obtaining a continuous series of instantaneous photographs of any portion of the aurora borealis at two neighboring stations; whence the altitudes are accurately determined just as it is expected to do in studies of meteors.

*Report of the Committee on Comets:* GEORGE C. COMSTOCK (chairman).

The work of this committee during the year has been concerned with observations of Halley's comet. The best methods of utilizing the present return were discussed by the committee and their conclusions were embodied in a circular letter that was widely distributed. The committee secured a grant of \$2,200 from the Bache Fund of the National Academy of Sciences to defray the expenses of temporarily installing a photographic telescope in the Hawaiian Islands. Mr. Ferdinand Ellerman had charge of this expedition, and for this purpose he was courteously granted leave of absence by the Carnegie Institution. The committee is further indebted to the John A. Brashear Company and to the Lick Observatory for the loan of the portrait lens and its mounting. Mr. Ellerman succeeded in securing an extremely valuable record of the comet's appearance. He also made careful observations of the sun at the time when

the comet transitted its disc, with wholly negative results, as was also the case at all other stations. Although the chances of success seemed small, the United States Weather Bureau undertook to secure from its observers reports as to any unusual atmospheric phenomena observed during or near the time that the earth was supposed to be passing through the comet's tail. For Dr. Humphreys's summary of these reports, as well as Mr. Ellerman's account of his activities in Hawaii, see their papers above.

The bill that is now pending in congress contemplating the appointment of a civilian head to the United States Naval Observatory was the subject of discussion both in the meetings of the council and in the general sessions of the society; as a result it was unanimously

*Resolved:* That the Astronomical and Astrophysical Society of America, deeming it essential to the success of an astronomical observatory that it should be under the direction of an eminent astronomer, expresses its appreciation of the efforts of the President of the United States to secure at the United States Naval Observatory this condition that has been found so effective in the great national observatories of other countries.

The officers elected for the ensuing year are: *President*, E. C. Pickering; *First Vice-president*, G. C. Comstock; *Second Vice-president*, W. W. Campbell; *Treasurer*, C. L. Doolittle; *Councilors*, W. J. Humphreys and Frank Schlesinger.

In response to a cordial invitation from Chief Astronomer King, it was decided to hold the next meeting at the Dominion Observatory in Ottawa, at some time next summer, the exact date to be fixed later by the president and the secretary.

Immediately after the close of the meeting many of those present started together on a journey across the continent for the purpose of attending the meeting of the Solar Union at Pasadena.

FRANK SCHLESINGER,

*Editor for the Eleventh Annual Meeting*

# SOCIETIES AND ACADEMIES

## THE PHILOSOPHICAL SOCIETY OF WASHINGTON

THE 683d meeting of the society was held on November 5, 1910, President Woodward in the chair. The following paper was read:

*On Gravity Determination at Sea:* Dr. L. A. BAUER, of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington.

On the "First Cruise of the *Carnegie* in the North Atlantic, which began at Brooklyn in September, 1909, and was closed at the same point in February of this year, determinations of the boiling point of pure water were made with the view of obtaining the necessary corrections to the aneroids aboard. Careful scrutiny of these observations gave the impression that with proper refinement in instrumental equipment and in method of observation, it would be possible to obtain data from which ocean gravity anomalies might be determined by the same method employed by Dr. Hecker in his cruises of 1901, 1904 and 1909—the so-called boiling point barometer method.

In order to determine wherein refinement was necessary and what the chief sources of error were, and their relative quantitative effects, the speaker made a careful review of previous ocean gravity observations. As a result of his combined study of the existing data and of the recent observations on the *Carnegie* he was led to the following conclusions on Hecker's ocean gravity work:

1. No wholly satisfactory measure of the absolute accuracy of the existing ocean gravity results can be secured by a mere perusal of the publications. If an independent examination is made and such checks applied as are possible, and when all sources of error are considered, it will not be surprising if it be found that many of the most recently published results are in error by an amount approximating to 0.1 cm. or about 1/10,000th part of  $g$ . In view of the pioneer nature of the work, opportunities presented for repeating observations, under different conditions, over regions previously traversed, should have been more fully embraced than was done.

2. One of the chief sources of error is to be ascribed to inconstancy of the corrections of the boiling point thermometers caused by their continued and protracted use; the error thus arising may at times transcend in importance all other ones. Not sufficient attention was paid to purely instrumental changes and corrections. Thus, for example, corrections for the boiling point thermometers of the Atlantic Ocean work of 1901 were used practically unaltered throughout the subsequent cruises of 1904 and 1909—after having been once supplied by the Physikalische Reichsanstalt, the corrections were never again redetermined. The belief that such purely instrumental changes would fully be taken account of in the adjustment is shown to be fallacious.

3. A source of error not considered is that due to possible imperfections of the vapor tension tables which must be used to convert boiling point temperatures into corresponding atmospheric pressures. An examination of the existing tables for the interval here under consideration, about 99° to 101° C., indicates that the errors of even the latest tables may at times be sufficient to cause an error in  $g$  of 0.1 cm. This error is not a constant one but varies with the boiling point temperatures; it is, hence, not wholly eliminated even in differential results.

4. Insufficient evidence has been given to prove that, in the reduction of the observations, it is best to omit those made on board vessels at anchor. A method of adjustment which already assumes practically what is to be proved, and which necessitates the rejection of data secured under supposedly the best conditions, weakening thereby the connecting link between the ocean results and the shore pendulum stations, can hardly be regarded as the best possible one. Instead some logical method of observation and of adjustment must be striven for which will take advantage to the fullest possible extent of the shore and harbor results.

5. The problem of sufficiently reliable ocean gravity results still awaits solution.

(The foregoing abstract was prepared by the author.)

R. L. FARIS,  
*Secretary*

THE AMERICAN CHEMICAL SOCIETY  
NEW YORK SECTION

THE second regular meeting of the session of 1910–11 was held on November 11.

The following papers were presented:

"The Electron Conception of Valence," K. G. Falk and J. M. Nelson.

"The Influence of Vapors on the Surface Tension of Mercury," Morris Loeb and S. R. Morey.

"Electrochemical Oxidation of some Hydrazine Salts" and "The Electrochemical Corrosion of some Metals in Sodium Trinitride," J. W. Turrentine.

Following these papers, Mr. Henry G. Pearson, editor of the *India Rubber World*, gave an illustrated lecture on "The Rubber Country of the Amazon."

C. M. JOYCE,  
*Secretary*